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By- Davis, Robert H.; Johnson, F. Craig

EVALUATION OF REGULAR CLASSROOM LECTURES DISTRIBUTED BY CCTV TO CAMPUS AND DORMITORY CLASSROOMS. FINAL REPORT.

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Television courses presented live to students in the classroom and simultaneously remitted by closed circuit television (CCTV) to dormitory and campus classrooms were compared for their effects on student performance and attitudes. The two types of courses had no significant effects on the overall distribution of grades. Over 6,000 students participating in the eight courses answered a questionnaire, and 136 students randomly selected from the courses were given a structured interview to determine the effects on their attitudes toward CCTV of viewing situation, course, subject matter, and depersonalization in the university. (The 10 course lecturers were also interviewed to determine their attitudes toward CCTV.) Questions dealing with interest and stimulation elicited no significant differences between students in live and television classes, but the students in television classes wanted more opportunity for contact with the lecturer. The majority of students preferred their own viewing condition, but would be willing to take television courses under certain conditions. Interview and questionnaire materials are included. (BB)

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Final Report: Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms

Project Report No. 202

May 1966

Robert H. Davis
Director of Learning Service

and

F. Craig Johnson
Assistant Director of EDP

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TABLE OF CONTENTS

Page

PURPOSE. 5

METHOD 7

Questionnaire 7
Student Interview 8
Faculty Interview 9

RESULTS AND DISCUSSION 10

Student Grades. 10
Student Attitudes 13

Purpose of the Lectures. 15
Viewing Conditions 16
Use of Television for Review 18

Student Interviews. 18
Faculty Interviews. 28

REFERENCES 33

APPENDICES 35

A - Course Questionnaires 35
B - Student Interview Schedules 43
C - Faculty Interview Schedule 47
D - Number of Students and Distribution
of Grades by Course. 49
E - Description of Facilities 50

Final Report:

Evaluation of Regular Classroom Lectures Distributed by CCTV to Campus and Dormitory Classrooms

Robert H. Davis, F. Craig Johnson[1]

Michigan State University

Closed circuit television (CCTV) is one of the most frequently suggested educational media for dealing with some of the problems created by rising enrollments. Two questions are inevitably raised whenever CCTV is proposed as a possible partial solution for these problems. First, do students taking a course by CCTV learn as much as those taking the same course live? And second, how do the attitudes of students taking a course by closed circuit television in remote campus and dormitory classrooms compare with students receiving the regular classroom lecture?

With respect to the first question, most studies have found no significant differences in the amount learned when comparisons are drawn between TV and non-TV sections of the same course. Schramm (1962) has summarized the literature bearing on student learning by CCTV. He found that of 393 comparisons at all educational levels, a few studies favored CCTV (21%) a few did not favor CCTV (14%), but most studies (65%) revealed no significant difference.

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[1] The authors wish to express their appreciation to Don Wylie and Jim Prange for their assistance in the conduct of student interviews, and to Dr. Brad Lashbrook for his contribution to the collection and analysis of the data reported in this study.

Student attitudes toward CCTV, however, tend to be influenced by the interaction of a number of variables. In general, TV is probably more acceptable to elementary and high school students than to college students. All other things being equal, college students in television classes tend to rate courses, instructors and instructional television less favorably than students in conventionally taught classes (Allen, 1960; Carpenter and Greenhill, 1958; Schramm, 1962). Acceptance, also, seems to depend on subject matter and teachers (Erickson and Chausow, 1960; Klapper, 1958; Starlin and Lollas, 1960). In addition, as students gain more experience with CCTV, they apparently come to accept it as a part of the educational process (Carpenter and Greenhill, 1955, 1958; Greenhill, Carpenter, and Ray, 1956), and other factors, such as the lecturer and the quality of the instruction, probably become more important determinants of student attitudes. In any case, attitudes of college students toward television instruction (or any other instructional method for that matter) appear to have little or no correlation with achievement (Macomber, 1960; Schramm, 1962).

A student's acceptance of instructional television will be a function of his attitude toward CCTV, his attitude toward material transmitted, and his attitude toward his environment. In this sense, the course and the instructor influence attitudes toward CCTV, and we have already noted some evidence bearing on these variables. Of equal importance, however, are attitudes toward another aspect of the environment which has apparently received less attention in the literature, i.e., attitude toward the university. If students perceive the university as being highly depersonalized, then one would expect this attitude to generalize to any educational innovation which the student perceives as increasing this depersonalization.

The present study examines not only the more conventional variables bearing on CCTV, but the interrelationship of attitudes about depersonalization and CCTV as well. The study is, also, unique in terms of its scope and experimental design, and is probably most like the television studies conducted from 1954-1957 at Pennsylvania State University (Carpenter and Greenhill, 1955, 1958).

Because live courses, taught in the instructor's "natural environment" (Appendix E), were telecast to both dormitory and campus classrooms, it was possible to evaluate the impact of CCTV on students rather than having students evaluate

CCTV against some idealized standard. In studies conducted without this control a student is typically asked to compare his experience with TV and some other mode of instruction. He may be asked, for example, "Have you been able to perceive the physical details of the presentation more clearly on TV than you probably would have in a regular classroom presentation?" Since, in this study some students were in the lecture hall with the instructor while others viewed the same lecture over TV, the question, "Did you have any difficulty seeing the lecturer or the materials he presented?" could be asked of both groups and their responses compared. This avoided the problem of judgements based on different standards.

In contrast to previous studies which have sometimes been limited as to number of students, number of courses and subject matter, this study involved a variety of subject matter taught in eight different courses enrolling about 6,000 students.

Typically, evaluations of this kind are conducted by the instructor of a single course or by those responsible for CCTV. In order to avoid this possible bias, the present study was not conducted by those responsible for the instruction or TV production.

The extensive dormitory instructional program at Michigan State University adds another dimension to this study. In the "living and learning" complexes students take course work in many forms including lectures, laboratories, discussion sections, as well as closed circuit television. In some, the TV set is in a dormitory classroom, in others the television set is in a multi-purpose lounge. Some students viewed the lecture in regular classrooms equipped for TV.

Television courses used in this study were available to students in the settings listed in Table 1 (Page 6). This combination of conditions provided a context for examining the effects of televised lectures on student attitudes and learning.

Purpose

The major purpose of this study was to examine the way in which viewing conditions influence student acceptance of CCTV; and to examine the effect of the course, the subject matter and depersonalization in the university on student attitudes toward CCTV.

Another objective was to explore attitudes of course lecturers toward CCTV.

An additional purpose was to examine the extent to which student grades differed for various viewing conditions.

TABLE 1

NUMBER OF SECTIONS OF LIVE-TV LECTURE COURSES OFFERED AT MICHIGAN STATE UNIVERSITY

FALL 1965
WINTER 1966

Course	Live Origination		TV Campus		TV Dorm	
	Fall	Winter	Fall	Winter	Fall	Winter
American Thought & Language	1		4		6	
American Thought & Language		1		4		5
General Biology	1		2	1	8	4
General Biology		1		1		5
The Communication Process		1				8
Nature of Language	1	1	5	4	10	9
Expository Writing	1		5		10	
Calculus	1	1	4	12	10	9
Foundations of Arithmetic	1		3		7	
Public Speaking	1		11	11	7	6

Method

In order to accomplish these purposes, comparisons were drawn between students in the lecture hall and students viewing the same lecture over CCTV. Methods used included an evaluation of (1) student attitudes, using a questionnaire (Appendix A) and a structured interview (Appendix B); (2) learning, using student term grades (Appendix D); and (3) course lecturer attitudes, using a structured interview (Appendix C).

Questionnaires

A questionnaire was administered during one of the last lectures of the term to 6,005 students in the 160 sections of the eight courses. Generally, it took the students about ten minutes to fill out the questionnaire and no more than fifteen minutes were required for the total administration. Questionnaires were machine scored and item analysis data collected. A factor analysis was used to validate an _a priori_ grouping of questionnaire items. The first 17 items were designed to answer the following kind of questions:

1. Did the student feel the lectures were stimulating?
2. Did the student get his questions answered?
3. Did the student get enough help from his instructors?
4. Could the student see and hear the lectures?

The factor analysis indicated that items related to questions 2 and 3 (above) combined into a single classification involving "student interaction with the lecturer" and on the final questionnaire three of the 17 items dealing with "attention" were not related to other groupings. The questionnaire was modified slightly between fall and winter term administrations. As a result of the fall experience, some questions were rewritten; some were omitted; and some new questions were added. The final grouping, based on the combination of the a priori judgement and an interpretation of both factor analyses, is presented below:

1. Stimulation of the Students
2. Student-Lecturer Interaction
3. Clarity of Presentation
4. Attention

The remaining items on the questionnaire concerned the purpose of the course, optimum viewing conditions, opportunities for additional viewing, and student grades.

Student Interviews

Structured interviews were held with 136 randomly selected students from CCTV sections of each of the eight courses. The interviews were conducted by the authors of this report and two graduate assistants. In order to determine the degree of agreement among interviews, 50% of the interviews involved at least two interviewers. At the close of a session, interviewers used a Likert-type five point scale to rate their impressions of student attitudes toward (1) the university (friendly-depersonalized); (2) the subject matter (likes-dislikes); (3) the course (likes-dislikes); and (4) CCTV (likes-dislikes).[2] Students were told that the focus of the interview was CCTV, but that the interviewers were interested in how students felt about several other issues as well. Students were assured that their answers would have no bearing on their grades and that the study was being conducted by an independent group within the university. Students seemed cooperative and even eager to discuss problem areas covered by the interview. Each interview lasted approximately one-half hour.

Faculty Interviews

Each of the lecturers was interviewed to determine his experience with CCTV and to evaluate his attitude toward it. Two interviewers were present throughout each interview. Faculty interviews explored the following: (1) attitude toward educational innovation; (2) the teacher's role; (3) the role of the course; (4) the qualities of a good CCTV instructor; and (5) attitudes toward CCTV, particularly the extent to which CCTV constituted a personal threat to faculty members. Interviews were not rated because of the small number. All faculty interviews lasted approximately one hour.

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[2] The reliability of interviewers was assessed using the intraclass correlation technique described in Guilford's Psychometric Method, pp. 395-97. Coefficients for each of the four areas of student attitudes during the fall term were: (1) university .89; (2) subject matter .82; (3) course .84; and (4) CCTV .90. During the winter, coefficients for each of these areas were: (1) university .83; (2) subject matter .73; (3) course .81; and (4) CCTV .81.

Results and Discussion

Student Grades

The overall distribution of grades for students who saw lectures live was not significantly different from students who saw lectures on TV. The same grading standards were used for students in live and television sections. In one course (Calculus - Fall 1965) grade distributions favored the live lecture. Grade distributions of other live and CCTV sections were not significantly different (Table 2 - Pages 11 & 12), including Calculus in the winter term.

Two analyses were run to see whether distributions of student's grades would differ in television sections offered at different locations. There were no significant differences in the fall term when all courses were combined. Campus television

TABLE 2

DISTRIBUTION OF COURSE GRADES FOR STUDENTS WHO RECEIVED LECTURE MATERIAL LIVE AND IN TELEVISION CLASSROOMS (EXPRESSED IN PERCENTAGES)[3]

Course	Mode	A	B	C	D	F	Term	Chi Square
American Thought & Language 111	LV	3	33	48	16	0	Fall 1965	Not Significant
(N=513)	TV	5	29	55	10	1		
American Thought & Language 112	LV	6	30	46	17	1	Winter 1966	Not Significant
(N=596)	TV	8	33	45	13	1		
General Biology 211	LV	8	48	35	8	0	Fall 1965	Not Significant
(N=114)	TV	20	33	42	3	2		
General Biology 212	LV	13	45	38	4	0	Winter 1966	Not Significant
(N=151)	TV	20	24	53	3	0		
Nature of Language	LV	14	27	42	10	7	Fall 1965	Not Significant
(N=295)	TV	11	31	40	12	6		
Nature of Language	LV	12	42	34	8	4	Winter 1966	Not Significant
(N=265)	TV	8	38	39	11	4		
Expository Writing	LV	22	51	27	0	0	Fall 1965	Not Significant
(N=216)	TV	16	52	30	2	0		
Calculus	LV	29	15	29	17	10	Fall 1965	Significant (.05 level)
(N=189)	TV	8	28	34	21	10		
Calculus	LV	19	11	48	14	8	Winter 1966	Not Significant
(N=325)	TV	17	20	39	17	7		

TABLE 2
(Continued)

Course	Mode	A	B	C	D	F	Term	Chi Square
Foundations of Arithmetic	LV	29	43	22	5	1	Fall 1965	Not Significant
(N=258)	TV	32	31	26	9	2		
Public Speaking	LV	11	24	52	11	2	Fall 1965	Not Significant
(N=588)	TV	16	21	53	6	4		
The Communication Process	LV	14	23	52	6	5	Winter 1966	Not Significant
(N=422)	TV	13	24	48	9	6		
Total	LV	14	33	39	11	3	Fall 1965	Not Significant
Total	TV	14	30	44	8	4		
Total	LV	11	29	46	11	3	Winter 1966	Not Significant
Total	TV	11	29	44	12	4		

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[3] A X^2 test revealed no significant difference between these distributions and the Registrar's final grade distributions (Appendix D) for the fall term. For the winter term a difference was found for Calculus between the stated distribution and that of the Registrar.

sections, however, were significantly better than dormitory television sections in the winter term (.05 level).

Student Attitudes

The first 17 questions asked students covered four aspects of the course (interest and stimulation, student-lecturer interaction, clarity of presentation, and attention). Responses of students viewing the lectures live were compared with students viewing the lectures in television classrooms. Differences between the two groups were tested for statistical significance. The results for all eight courses combined are shown in Table 3 (Page 14).

Questions dealing with interest and stimulation revealed no significant difference between those students who saw the lectures live and those who viewed the lectures in a television classroom.

Students in television classrooms apparently did not feel they had a satisfactory opportunity to meet with their instructors outside of class and felt they would have done better in the course if it had been easier to discuss their problems with the course lecturer. This was most often the case when students felt the

TABLE 3

DIFFERENCES ON THE FIRST 17 ITEMS OF THE QUESTIONNAIRE BETWEEN STUDENTS WHO SAW LECTURES LIVE AND STUDENTS WHO VIEWED LECTURES ON CCTV (5% LEVEL OF SIGNIFICANCE TESTED USING X^2)

	Item			Significant Difference	
	Fall	Winter	Question	Fall	Winter
Interest & Stimulation	3	3	Course most interesting	No	Yes (+ TV)
	10		Learned a great deal	No	
		10	Didn't learn a great deal		No
	13	13	Thought about subject	No	No
	15	15	Take additional courses	No	No
Student-Lecturer Interaction	4	4	Need to ask questions	Yes (- TV)	Yes (- TV)
	6	6	TV receive lower grades	Yes (+ TV)	Yes (+ TV)
	7	7	Contact instructor	Yes (- TV)	Yes (- TV)
	9		What's going on in course	No	
		9	Visual material held my attention		No
	11	11	Discuss problems with lecturer	Yes (- TV)	No
	12		Learning myself	Yes (+ TV)	
		12	Disturbances in room		No
	17	17	Lecturer determines grade	No	No
Clear Presentation	1	1	Visual materials helped	No	No
	2	2	Seeing lecturer or materials	Yes (- TV)	No
	5		Time to clarify subject	No	
		5	Time to absorb or assimilate material		No
	16	16	Hear the lecture	No	No
Hold Attention	8	8	Enough to hold attention	Yes (- TV)	No
	14	14	My attention wandered	Yes (- TV)	No

lecturer played a major role in determining course grades.

Students in television classrooms had difficulty seeing lecture materials especially in mathematics and science courses. During student interviews, it was reported that the television camera would often leave formulae before students could copy them down. *In the fall term, lectures did not hold the attention of students in television classrooms as well as the same lectures delivered in the lecture hall live. This was not true, however, in the winter term.* Although this was most apparent in the English courses, nothing in student or faculty interviews explained this difference. This phenomenon requires further study.

Purpose of the Lectures. Students were asked to respond to five questions regarding the purpose of the lectures. Answers to these questions are probably most useful to course lecturers and have little bearing on the evaluation of CCTV. *Students who viewed the course lectures in a TV classroom did not perceive the purpose of the lectures differently from students who saw the lectures live.* It should be noted, on the other hand, that the eight courses selected for this study seem to represent a variety of purposes in the minds of the students.

Major purposes associated with these courses were to teach:

American Thought and Language - Facts and Information, Applications and Problem Solving, Attitudes and Appreciation

General Biology - Facts and Information

Calculus - Application and Problem Solving

Nature of Language - Principles and Generalizations

Expository Writing - Principles and Generalizations, Attitudes and Appreciation

Foundations of Arithmetic - Principles and Generalizations, Application and Problem Solving

Public Speaking - Principles and Generalizations

The Communication Process - Principles and Generalizations

Viewing Conditions. In the fall term, students were asked where they thought the best place to get the lecture material for their course would be. Locations included: (1) a large lecture hall on campus; (2) small campus classrooms with television; and (3) small dormitory classrooms with television. Responses to these questions were analyzed by dividing students into groups according to the actual conditions under which they viewed the lecture. Table 4 (Page 17) summarizes the choices of each group.

TABLE 4

PREFERRED VIEWING CONDITIONS (FALL TERM 1965)
(Ranked 1-3)

Actual Viewing Conditions	Preference for Viewing Conditions		
	Large Lecture Live	Small Classroom Television	
	Campus	Campus	Dormitory
Live Campus Lecture	1	3	2
TV Campus Classroom	3	1	2
TV Dormitory Classroom	3	2	1

When data are summarized across courses, it is clear that most students prefer the condition under which they actually received the course lecture material. With one exception, (Calculus) students most preferred the condition under which they actually received the lecture. Although second and third choices were not as consistent, generally students who viewed the lectures in a television classroom selected another TV condition as their second choice.

In the winter term, students were asked to select conditions under which they would be willing to take additional televised courses. Most students (87%) would not object to taking courses on television under certain conditions. Some of these conditions were perceived more favorably than others.

1. If television sections are offered at the same time and in the same location as the live, and presumably provide no advantage for the student, about 45% of the students would be willing to take additional televised lectures.

2. When the choice is between televised sections and a large lecture hall, about 50% of the students would take additional televised lectures.
3. If students felt they could get a better lecturer on TV, about 60% would be willing to take TV sections.
4. If TV were in students' residence about 65% would take TV lectures.
5. If the TV lectures were at a more convenient time, about 70% would be willing to take TV lectures.
6. When all other sections are filled, then about 75% of the students would take it on TV.

Use of Television for Review. Items were included to determine students' use of television review rooms. The use of review rooms varied with course and instructor. When both terms are considered, biology students used review rooms most and students in speech and communications least. When a different instructor taught the same Calculus course in the winter term, the use of review rooms decreased. These changes in review room use can be seen in Table 5 (Page 19).

Student Interviews

Interviewer ratings of student attitudes toward the four topics discussed, i.e., CCTV, depersonalization in the university, the subject matter, and the course are summarized in Table 6 (Page 20).

TABLE 5

PERCENT OF STUDENTS USING REVIEW ROOMS ONE OR MORE TIMES (FALL AND WINTER TERMS)

	Fall	Winter
General Biology (1)	42%	34%
General Biology (2)		44%
The Communication Process		18%
Nature of Language	14%	30%
Expository Language	24%	
Calculus	48%	25%
Foundations of Arithmetic	40%	
Public Speaking	15%	17%

TABLE 6

SUMMARY OF TWO INTERVIEWER RATINGS IN EACH OF THE FIVE LIKERT CATEGORIES ON THE FOUR MAJOR ISSUES DISCUSSED DURING INTERVIEWS (EXPRESSED IN PERCENTAGES)

LIKERT CATEGORIES

ISSUES DISCUSSED	Likes Very Much (Very Personal & Friendly)		Likes (Friendly)		Indifferent (Neutral-Neither)		Dislikes (Somewhat Depersonalized)		Dislikes Very Much (Strongly Depersonalized)	
	Fall	Winter	Fall	Winter	Fall	Winter	Fall	Winter	Fall	Winter
CCTV	13%	12%	34%	38%	26%	29%	22%	18%	5%	3%
Depersonalized	19%	18%	40%	50%	21%	22%	13%	9%	7%	1%
Course	27%	17%	38%	43%	9%	22%	22%	16%	4%	2%
Subject Matter	23%	29%	38%	53%	12%	15%	5%	2%	12%	1%

In general, students appear to be somewhat less positive about TV than other topics discussed. Michigan State does not appear to be perceived by most students as a depersonalized institution. Students probably have more definite and fixed opinions about courses and subject matter than about either CCTV or depersonalization in the university. Many students were quite positive about their current experience with CCTV, yet said they did not like television classes in general.

Data from interviews are always somewhat difficult to interpret. About seventy-five percent of the students do not express a negative attitude toward CCTV. Several things may improve attitudes toward CCTV in general and should be considered, including: (1) careful selection and orientation of lecturers; (2) choice of courses to be taught by CCTV; (3) student orientation to the medium; and (4) more opportunity to meet with instructors outside of lectures.

The structure of the interview permits some interesting comparisons to be drawn among the four major areas discussed and may provide some insights into the determinants of student attitudes toward CCTV.

In Tables 7 and 8 (Pages 22 and 23), ratings of the two interviewers have been combined and attitudes toward CCTV are compared with attitudes toward the course and the university,

TABLE 7

ATTITUDES OF STUDENTS TOWARD BOTH THE COURSE AND CLOSED CIRCUIT TELEVISION (EXPRESSED IN PERCENTAGE) OF STUDENTS FALLING WITHIN EACH OF NINE POSSIBLE CATEGORIES, e.g., 47% OF THE STUDENTS (WINTER TERM) LIKED THE COURSE AND TELEVISION

Attitude Toward CCTV

		Likes		Neutral		Dislikes	
		Fall	Winter	Fall	Winter	Fall	Winter
Attitude Toward Course	Likes	27%	47%	21%	12%	16%	11%
	Neutral	8%	7%	1%	3%	1%	5%
	Dislikes	12%	5%	4%	5%	10%	6%

TABLE 8

ATTITUDES OF STUDENTS TOWARD BOTH THE UNIVERSITY AND CLOSED CIRCUIT TELEVISION EXPRESSED IN PERCENTAGE OF STUDENTS FALLING WITHIN EACH OF NINE POSSIBLE CATEGORIES, e.g., 45% OF THE STUDENTS (WINTER TERM) PERCEIVED THE UNIVERSITY AS FRIENDLY AND LIKED TELEVISION

Attitude Toward CCTV

		Likes		Neutral		Dislikes	
		Fall	Winter	Fall	Winter	Fall	Winter
Attitude Toward University	Friendly	26%	45%	8%	11%	11%	12%
	Neutral	16%	9%	8%	4%	4%	5%
	Unfriendly	16%	5%	6%	5%	5%	5%

respectively. Students with positive attitudes toward the university and the course, expressed more positive attitudes about CCTV.

It is evident that student opinions about each of the four areas cover the full range. On the whole, the majority of students are probably positive about the university, the subject matter, the course, and in many cases even CCTV. It is possible that these findings are attributable to the relationship between interviewers and interviewees. Several students, for example, seemed anxious not to "hurt the feelings of the administration," and negative comments were sometimes prefaced with such remark as "I hope this doesn't make you feel too bad but ...." A substantial number of students were apparently not intimidated by the relationship because they freely expressed their opinions. Thus, for example, in each of the four areas (Table 6, Page 20) between 10 - 21% of the students made negative comments.

A variety of impressions and hypotheses inevitably emerged from these interviews. Some of these impressions find support in the data already reported; others are nothing more than hunches:

(1) _Students interviewed do not, on the whole, appear to feel that Michigan State is a depersonalized institution_. About two-thirds of the students felt that the university was either friendly or very friendly whereas less than twenty percent felt it

was somewhat or strongly depersonalized. Students frequently noted that they felt "like an IBM card" or "a number" at registration, but that they were able to form friendly and personal relationships in the dorms. The fact that Michigan State is largely a resident institution may, indeed, be a key factor in shaping a student's impression of the university. Many expected to find Michigan State a depersonalized, unfriendly place, and were surprised to find this was not the case. Also noted by many students was the impression of friendliness created by correspondence regarding their enrollment in Michigan State and the atmosphere during their freshman orientation sessions. Students also noted that it was generally possible to see an instructor if a student wanted to put forth the effort.

(2) Many students appear to enter the CCTV experience with a negative attitude toward CCTV which gradually becomes more positive with experience. Since no assessment was made of student attitudes before and after the CCTV experience, there is no way of testing this hypothesis statistically within the framework of the present study. On the other hand, a number of students remarked that they were quite disappointed when they first discovered a course was to be taught by TV but by the time of the interview at the end of the term, reported liking CCTV. From these interviews one also gets the impression that the positive

shift in attitude toward CCTV applies only to the particular course being televised and is not great enough to carry over to other courses. Some support for this phenomenon can be found in the answers to questions 25, 26 and 27 on the fall term questionnaire, where students report at the end of the term that "the best way to get the lecture material in a course" is whatever way they are already getting it (Table 4, Page 17).

(3) One of the most significant differences between the lecture hall and the TV classroom lies in the fact that the lecture hall allows two-way communication whereas CCTV does not. Typically, students taking courses by CCTV do not have the opportunity to ask questions directly of the lecturer. This apparently bothers some students more than others. While some students would like immediate clarification of certain issues, others feel that poorly structured questions lead to fruitless discussion. There are, however, other consequences of one-way communication which are equally---if not more---important. The student will be less inclined to read a newspaper, chat with a friend, or get up and walk out when the lecturer is in the room. When the lecturer is not present then talking, joking, etc. are probably a more common source of disruption in TV sections than in live sections. This problem is probably most severe in those sections without any authority figures, such as graduate assistants, present. In addition to controlling students, the lecturer's presence may, also, motivate them.

(4) *In some TV sections the disturbance created by inattentive students distracts others*. When there is excessive redundancy or when the lecturer has a peculiar mannerism or when he is awkward, etc., disturbances within TV sections may occur. This is not true of all courses, nor is it necessarily true of all sections within a particular course. When the lecture has a lively pace and contains appropriate content attention does not appear to be a problem.

(5) *Students stated a preference for a live lecture rather than TV. But, when the choice was better defined, their preference often shifted*. When students say they prefer a live lecture to CCTV, they appear to be comparing TV to an idealized standard, e.g., small classes with a highly qualified instructor present at a convenient time and place. When the alternatives are made more realistic and time and place of class meeting, qualifications of instructors, etc. are considered, the choice rapidly becomes more difficult. When presented with various alternatives, students interviewed mentioned at least one situation in which they would select a television section over a live one. (For additional discussion of this area see Page 17)

(6) *If a student is ready to assume greater responsibility for his own education, he is probably more willing to accept educational innovations*. While most students are aware of a

growing demand for education and a teacher shortage, they have different ideas on the solution to the problem. Some students feel that teachers will have to find new ways to teach and others feel that students will have to find new ways to learn. The latter group seems more willing to accept independent learning in various forms including reading lists, programmed instruction and CCTV.

Faculty Interviews

In view of the relatively small number of instructors involved in the study (N=10), it was not possible to analyze statistically faculty interview data. Instead, responses of faculty members to a series of structured questions are summarized.

1. There was a wide range of faculty opinion on the question of student acceptance of the added responsibility demanded by educational innovations such as CCTV. Responses ranged from "definitely not" to "we tend to underestimate students' capabilities." Faculty members agreed that a student's past experience, his motivation, and preparation have an important bearing on his ability to handle independent learning experiences. There was some concern over the readiness of freshmen and sophomores to deal with this much independence. Accepting the responsibility to attend TV lectures, staying in the room when

bored, refraining from talking when the impulse strikes, all require a degree of maturity which may not--and indeed, probably does not--characterize entering freshmen. Those who lack this maturity can create an atmosphere in which little learning can occur.

2. The role of the university teacher depends on the instructors and the courses they taught. Suggested roles included: (a) to "lead" a student step-by-step through problems and "point-up" important issues or techniques; (b) to change and convey attitudes about a course and what an area is like; (c) to impart knowledge; (d) to serve as a model and show how a professional approaches problems in his discipline; (e) to personify the values of the discipline taught; (f) to relate subject matter to the everyday experience of the student; and (g) to provide a control of the environment--particularly for freshmen and sophomores.

3. Most faculty members agreed that a good TV instructor should be "spontaneous," "lively," and "active." One or two said it helped to be somewhat dramatic, and perhaps, even a "bit of a ham." At the same time, there was general agreement that CCTV required more preparation than the usual classroom lecture. One or two CCTV instructors kept "two audiences" in mind. On the other hand, some faculty members treated CCTV as

"just another lecture" and paid very little attention to the invisible audience.

4. For most faculty members, CCTV was something new and different which they were anxious to try. Some faculty members wanted to go on TV to get a "feel for the medium," some for "ego gratification." At least one was "drafted" and one or two elected. There is no doubt that CCTV offers an opportunity for some faculty members to extend their influence and become known by a large number of students. Apparently, some students believe that only "good instructors" are allowed to give TV lectures.

5. Most teachers commented on the administrative burdens which TV created for them. Many factors apparently contribute to the increased administrative load, including the large number of students involved in TV courses, the need to organize and coordinate the activities of additional sections, and often the responsibility for more graduate assistants assigned to remote locations. To a degree at least, this represents an additional responsibility to "manage" the learning process. As already noted, TV demands extensive preparation--the expense of CCTV, the size of the audience, and the visibility to other faculty members and the administration--all exert a powerful pressure on the lecturer to organize more completely. These factors plus

the need to communicate to a "hidden audience" whose reactions could not be seen, was for some lecturers a troublesome and exhausting experience.

6. None of the faculty members interviewed felt personally threatened by CCTV. On the other hand, most felt that it did concern some of their colleagues. The source of this concern was not displacement, but something else. If CCTV becomes widely used for university instruction, it is clear that this will involve considerable change in the present patterns of teaching and possibly, the curriculum as well. Some faculty members probably suspect CCTV because they associate it with "spying" and "big brother." The fact that the President, the Provost and others in the administration can watch an instructor without his being aware of it lends some support to this fear. Precisely how the widespread use of CCTV will influence the teacher's role is not clear - and it is precisely this uncertainty about the future which is probably the root of much of the concern. Some faculty members are probably, also, against automation in any form because it is part of a larger trend toward depersonalization in our society.

7. All CCTV course lecturers felt the need for additional support in the preparation of visual materials. In most cases, sufficient funds for this purpose were provided. Calculus, however, presented unique instructional requirements. The manipulative

nature of the mathematics taught apparently requires large display areas for the development of concepts. One course lecturer felt that the limitations of a single overhead projector seriously constrained his presentation and restricted his content. To remedy this problem in the Calculus course would require a major revision of the present CCTV system. This problem is currently under study.

8. The ownership of CCTV educational tapes and control over their use can be expected to become an issue as CCTV expands. Today the problem is not clearly defined. On the one hand, there is a tradition in universities granting the rights to certain products, e.g., textbooks, to their creators even though the products are often produced largely at university expense. On the other hand, there is a trend in government and industry for the creator of inventions, written material, etc. to assign his rights to the organization which provides him with facilities and pays his salary. The ownership of educational CCTV tapes is a matter requiring continued university attention.

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APPENDIX A

COURSE

QUESTIONNAIRE

Fall Quarter
1965

By answering this questionnaire you will be helping the University in a very important way to evaluate different methods of instruction. This evaluation will not be made until after your instructor has turned in your final grade, and your answers to these questions will not affect your grade. Your careful consideration will help the University improve instruction methods used in the future.

INSTRUCTIONS: Fill in the top three lines on the answer sheet supplied. Print the information with the soft lead pencil given to you. In the box at the right top of your answer sheet, fill-in the correct blanks for your student number.

Respond to the following statements by blackening the space on the answer sheet which, according to the key below, best describes your reaction to the statement.

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

1. The visual materials used in the lectures helped me to understand the subject matter of this course.

2. I had no difficulty seeing the lecturer or the materials he presented.

3. This course has been among the most interesting I have taken.

4. I felt the need to ask questions which were not answered in the lecture or discussion part of the course.

5. The lecturer normally has taken enough time to clarify one aspect of the subject before moving on to the next aspect.

6. Students taking this course by television will receive lower grades than those students who are in the same room with the lecturer.

7. I have had a satisfactory opportunity to contact my instructor when I had problems that required his personal attention.

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

8. Often there wasn't enough going on during the lectures to hold my attention.

9. I sometimes didn't know what was going on in this course with regard to assignments, lecture topics, examinations, etc.

10. I feel I have learned a great deal in this course.

11. I would have done better in this course if it had been easier to discuss problems with the lecturer.

12. This course has forced me to do much of the learning myself.

13. I have often thought about the subject matter of this course outside of the classroom.

14. I found my attention wandering frequently during lectures.

15. As a result of these lectures, I will probably take additional non-required courses in this area.

16. I could always hear the lecturer in this course.

17. The course lecturer plays a major role in determining my grade.

18. The purpose of these lectures was to teach facts and information.

19. The purpose of these lectures was to teach general principles and generalizations.

20. The purpose of these lectures was to teach application and problem solving skills.

21. The purpose of these lectures was to teach attitudes and appreciations.

22. The purpose of these lectures was to instill a desire for further learning.

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

23. I intend to take as many TV courses as fit into my schedule.

24. I will recommend TV courses in general to others.

Rank questions 25, 26 and 27 in order (darken the 1 space on the answer sheet for the most preferred, space 2 for the next preferred and space 3 for the least preferred).

The best way to get the lecture materials for a course is to:

25. Attend a lecture delivered by an instructor in a large lecture hall on campus.

26. Attend a lecture presented by television to a small campus classroom.

27. Attend a lecture presented by television in a small dormitory classroom.

28. I have attended evening review sections

1. never
2. once or twice
3. on several occasions
4. many times
5. always

29. I have viewed the television lectures in other regular sections

1. never
2. once or twice
3. on several occasions
4. many times
5. always

30. My major reason for taking this course is that it was:

1. a free elective
2. recommended by my advisor
3. closely related to my major field
4. a part of my major
5. required for graduation

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

31. My major is

1. Arts & Letters, Comm. Arts, Justin Morrill College
2. Social Science, Natural Science
3. Education, Business, Home Economics
4. Agriculture, Engineering, Vet. Medicine
5. Non-preference

32. I am a

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Graduate Student

33. My accumulative grade point average is

1. below a 2.0
2. between 2.0 and 2.49
3. between 2.5 and 2.99
4. between 3.0 and 3.5
5. above 3.5

(If not established, leave blank)

34. I expect my grade in this course to be

1. F
2. D
3. C
4. B
5. A

COURSE QUESTIONNAIRE

Winter
Quarter
1966

By answering this questionnaire you will be helping the University in a very important way to evaluate different methods of instruction. This evaluation will not be made until after your instructor has turned in your final grade, and your answers to these questions will not affect your grade. Your careful consideration will help the University improve instruction methods used in the future.

INSTRUCTIONS: Fill in the top three lines on the answer sheet supplied. Print the information with the soft lead pencil given to you. In the box at the right top of your answer sheet, fill-in the correct blanks for your student number.

Respond to the following statements by blackening the space on the answer sheet which, according to the key below, best describes your reaction to the statement.

KEY:
1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

1. The visual materials used in the lectures helped me to understand the subject matter of this course.

2. I had no difficulty seeing the materials the lecturer presented.

3. This course has been among the most interesting I have taken.

4. I felt the need to ask questions which were not answered in the lecture or discussion part of the course.

5. I frequently needed more time to absorb or assimilate material presented during the lecture.

6. Students taking this course by television will receive lower grades than those students who are in the same room with the lecturer.

7. I have had a satisfactory opportunity to contact my course lecturer when I had questions.

8. Often there wasn't enough going on during the lectures to hold my attention.

9. The visual materials held my attention.

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

10. I didn't learn a great deal in this course.

11. I would have done better in this course if it had been easier to discuss problems with the lecturer.

12. It was frequently difficult to follow the lecture because of disturbances in the room.

13. I have often thought about the subject matter of this course outside of the classroom.

14. I found my attention wandering frequently during lectures.

15. As a result of these lectures, I will probably take additional non-required courses in this area.

16. I could always hear the lecturer in this course.

17. The course lecturer plays a major role in determining my grade.

18. The purpose of these lectures was to teach facts and information.

19. The purpose of these lectures was to teach general principles and generalizations.

20. The purpose of these lectures was to teach application and problem solving skills.

21. The purpose of these lectures was to teach attitudes and appreciations.

22. The purpose of these lectures was to instill a desire for further learning.

23. I have attended evening review sections

    1. never
    2. once or twice
    3. on several occasions
    4. many times
    5. always

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

24. I am a

1. Freshman
2. Sophomore
3. Junior
4. Senior
5. Graduate Student

25. My cumulative grade point average is

1. below a 2.0
2. between 2.0 and 2.49
3. between 2.5 and 2.99
4. between 3.0 and 3.5
5. above 3.5

(If not established, leave blank)

26. I expect my grade in this course to be

1. F
2. D
3. C
4. B
5. A

I will take additional courses on television if:

27. The alternative is a large lecture hall.

28. The TV section is scheduled at a more convenient time.

29. The TV section is taught by a better lecturer.

30. I can remain in my residence and see the lectures on television.

31. All non-television sections are closed.

32. It is offered at the same time and in the same general location as the live lecture.

33. Under no conditions will I take additional courses on television.

KEY: 1 - Strongly agree
2 - Agree
3 - Uncertain
4 - Disagree
5 - Strongly disagree

34. At which of the following locations are you getting the lectures for this course?

1. Giltner Lecture Hall
2. Campus Television Rooms
3. Brody
4. Fee - Akers - McDonel
5. Case - Wilson - Wonders

APPENDIX B

Student Interview Schedule

Fall 1965

I. Attitudes toward Depersonalization at M.S.U.

A. "As you probably know M.S.U. has over 35,000 students this fall. Some students appear to feel that this creates a pretty impersonal atmosphere. How do you feel about this?"

B. "Some students appear to feel that they are treated like numbers rather than people. Have you felt this way?"

If "yes": "What do you think accounts for this?"

If "no": "Why do you think some students feel this way?"

C. "Do you think the university and staff are interested in you as an individual?"

If "no": "Why aren't they interested in students as humans?"

If "yes": "Well, some people apparently feel they aren't interested in the students as individuals. Why do you suppose this is?"

II. Attitudes toward the Subject Matter

A. "Let's see you've just completed a course in _________. What's your reaction to the subject matter of the course? I don't mean the teacher or the way it was presented, but the content of the course. Are you really interested in the area or is it kind of dull and so on?"

B. If "not interested": "Why is it that you're not particularly interested in this area?"

If "interested": "What is there about this area that particularly interests you?"

Student Interview Schedule - Page 2

C. "Do you plan to take any additional courses in this area? Why?"

III. Attitudes toward CCTV and Instruction

A. "It is sometimes said that the best teaching situation is a teacher on one end of a log and the student on the other. How do you feel about this? Do you think the best way to teach is one teacher to one student?"

B. "Well, of course, today it isn't possible to teach in this way. Even if we could afford it, there just aren't enough teachers. Michigan State is seeking ways around this problem of increasing numbers of students, limited budgets and so on. One way is to try to improve instruction using teaching machines, programmed instruction, closed circuit TV, and more individual instruction in carrels using tape recorders, projectors and so on. What's your reaction to this? Will it work?"

C. "All of this involves students taking more direct responsibility for their own learning. Is that a good idea?"

D. "You've had a course by closed circuit TV now. What was your reaction to it?"

E. "Do you feel you learned as much as the students taking the course in the regular classroom?"

F. "Did you tend to think of the lecturer as a "TV personality" or a real professor on campus?"

G. "Would you be willing to take additional courses by closed circuit TV?"

Student Interview Schedule

Winter 1966

I. Initial Steps in the Interview

1. Brief introduction.
2. Explain purpose of the interview.
3. Ask about home town. Size of high school as lead to depersonalization issue.

II. Areas of Interest to be Explored in Order

1. Attitudes toward Depersonalization at M.S.U.

    (a) "As you probably know M.S.U. has over 35,000 students this winter. Some students appear to feel that this creates a pretty impersonal atmosphere. How do you feel about this?"

    (b) "Some students appear to feel that they are treated like numbers rather than people. Have you felt this way?"

    (c) "Do you think the university and staff are interested in you as an individual?"

2. Attitudes toward the Subject Matter

    (a) "Let's see you've just completed a course in ______. What's your reaction to the subject matter of the course? I don't mean the teacher or the way it was presented, but the content of the course. Are you really interested in the area?"

    (b) "Do you plan to take any additional courses in this area?"

3. Attitude toward the Course

    (a) "Let's discuss the course now. You've described your reaction to the subject matter. How did this course stack-up? Was it better or worse than you had expected?"

    (b) "What was your reaction to the way the material was presented?"

Student Interview Schedule - Page 2

4. Attitudes toward CCTV and Instruction

   (a) "You've had a course by closed circuit TV now. What was your reaction to it?"

   (b) "Do you feel you learned as much as the students taking the course in the regular classroom?"

   (c) "Did you tend to think of the lecturer as a "TV personality" or a real professor on campus?"

   (d) "Would you take additional courses by closed circuit TV?"

III. Close Interview

1. Express appreciation to student for his help and assure him that his reactions and those of other students will be of interest to everyone working in this area.

APPENDIX C

Faculty Interview Schedule

Fall 1965

I. Educational Innovation

A. As you know, there are a number of proposals for educational innovation, including programmed learning, CCTV, greater emphasis on independent learning, how do you feel about these things? Are they a good idea?

B. Will students accept the added responsibility that these innovations demand?

C. How did you feel about innovation of this kind before you taught a course by CCTV? Did the experience change your feelings about innovation?

II. The Teacher's Role

A. What do you feel the role of a teacher is?

B. How does CCTV affect that role?

C. How important is course development to the professional life of a teacher?

III. The Role of the Course

A. What is the role of the course you taught on CCTV in the department? The university?

B. What do you feel is the purpose of the lectures in this course?

IV. Personal Attitudes

A. Do you think handling a course on CCTV requires a special sort of person or is it something just about any experienced teacher could do?

B. What are the qualities of a good TV instructor?

C. Why did you go on CCTV?

Faculty Interview Schedule - Page 2

V. CCTV

A. Did you enjoy the TV experience?

B. What special problems does CCTV raise for the instructor? The university? The profession?

C. Was the support provided you enough to get done the kind of job you had hoped to do?

APPENDIX D

NUMBER OF STUDENTS (N) AND DISTRIBUTION OF GRADES (PERCENT) BY COURSE BASED ON REPORT 7701, OFFICE OF THE REGISTRAR, MICHIGAN STATE UNIVERSITY, FALL 1965 AND WINTER 1966

	Term	A		B		C		D		F	
		N	%	N	%	N	%	N	%	N	%
American Thought & Language 111	Fall 1965	68	10	161	25	316	49	97	15	9	1
American Thought & Language 112	Winter 1966	44	7	191	32	271	46	85	14	5	1
General Biology 211	Fall 1965	23	12	68	34	89	45	13	7	5	3
General Biology 211	Winter 1966	26	14	60	33	92	51	0	0	3	2
General Biology 212	Winter 1966	25	17	53	35	66	44	5	3	2	1
Nature of Language	Fall 1965	40	10	109	29	155	41	55	14	26	6
Nature of Language	Winter 1966	32	9	134	36	145	39	44	11	21	5
Expository Writing	Fall 1965	89	18	245	50	144	29	6	1	7	1
Calculus	Fall 1965	42	10	85	21	117	29	86	21	80	20
Calculus	Winter 1966	107	17	113	18	214	35	100	16	82	14
Foundations of Arithmetic	Fall 1965	112	26	140	32	127	29	39	9	18	4
Public Speaking	Fall 1965	105	14	150	20	406	53	61	8	41	5
Public Speaking	Winter 1966	96	13	142	20	384	54	47	7	48	6
The Communication Process	Winter 1966	58	14	100	24	208	49	33	8	23	5

APPENDIX E

Description of Facilities

The television origination facilities included two image orthicon cameras located in a converted projection booth at the rear of a 300 seat lecture hall. The cameras were equipped with telescopic lenses (a 16mm to 32mm zoom on one camera and a 12", 15", 18" and 20" on the second camera). A vidicon camera was used as a slide chain. A special effects amplifier provided split-screen presentation. Lecturers were provided with a wireless microphone.

Display-demonstration devices available for use by the instructor included: a conventional blackboard, flannel board, two overhead projectors and a screen, a hook and loop board (similar to flannel board), and a lectern. The lecture area was lighted with approximately 100 foot-candles of light.

Lectures originating in these facilities, were transmitted to a recording center where it was recorded on transverse videotape recorder - reproducers. Simultaneously, the lectures were broadcast over telephone lines to campus and dormitory classrooms.

Television personnel included a director, two engineers, and two cameramen.